

**THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:**

1. A combination of polynucleotides for amplification and detection of a portion of a *Salmonella phoP* gene, said portion being less than about 500 nucleotides in length and comprising at least 60 consecutive nucleotides of the sequence set forth in SEQ ID NO:30, said combination comprising:
  - (a) a first polynucleotide primer comprising at least 7 nucleotides of the sequence as set forth in SEQ ID NO:1;
  - (b) a second polynucleotide primer comprising at least 7 nucleotides of a sequence complementary to SEQ ID NO:1; and
  - (c) a polynucleotide probe comprising at least 7 consecutive nucleotides of the sequence as set forth in SEQ ID NO:30, or the complement thereof.
2. The combination of polynucleotides according to claim 1, wherein said first and second polynucleotide primers comprise at least 7 nucleotides of the sequence as set forth in any one of SEQ ID NOs:16 to 22.
3. The combination of polynucleotides according to claim 1 or 2, wherein said polynucleotide probe comprises at least 7 nucleotides of the sequence as set forth in any one of SEQ ID NOs:35, 37, 39 or 41.
4. The combination of polynucleotides according to any one of claims 1 to 3, wherein said first polynucleotide primer comprises at least 7 nucleotides of the sequence as set forth in SEQ ID NO:32 and said second polynucleotide primer comprises at least 7 nucleotides of the sequence as set forth in SEQ ID NO:33.
5. The combination of polynucleotides according to claim 1, wherein said first polynucleotide primer comprises the sequence as set forth in SEQ ID NO:32, said second polynucleotide primer comprises the sequence as set forth in SEQ ID NO:33 and said polynucleotide probe comprises the sequence as set forth in SEQ ID NO:34 or 36.

6. The combination of polynucleotides according to claim 1, wherein said first polynucleotide primer comprises the sequence as set forth in SEQ ID NO:32, said second polynucleotide primer comprises the sequence as set forth in SEQ ID NO:33 and said polynucleotide probe comprises the sequence as set forth in SEQ ID NO:38 or 40.
7. A pair of polynucleotide primers for amplification of a portion of an *Salmonella phoP* gene, said portion being less than about 500 nucleotides in length and comprising at least 60 consecutive nucleotides of the sequence set forth in SEQ ID NO:30, said pair of polynucleotide primers comprising:
  - (a) a first polynucleotide primer comprising at least 7 nucleotides of the sequence as set forth in SEQ ID NO:1; and
  - (b) a second polynucleotide primer comprising at least 7 nucleotides of a sequence complementary to SEQ ID NO:1.
8. The pair of polynucleotide primers according to claim 7, wherein said first and second polynucleotide primers comprise at least 7 nucleotides of the sequence as set forth in any one of SEQ ID NOs:16 to 22.
9. The pair of polynucleotide primers according to claim 7 or 8, wherein said first polynucleotide primer comprises at least 7 nucleotides of the sequence as set forth in SEQ ID NO:32 and said second polynucleotide primer comprises at least 7 nucleotides of the sequence as set forth in SEQ ID NO:33.
10. The pair of polynucleotide primers according to claim 7, wherein said first polynucleotide primer comprises the sequence as set forth in SEQ ID NO:32 and said second polynucleotide primer comprises the sequence as set forth in SEQ ID NO:33.
11. A method of detecting one or more *Salmonella* species in a sample, said method comprising:

- (a) contacting a test sample suspected of containing, or known to contain, a *Salmonella* target nucleotide sequence with the combination of polynucleotides according to any one of claims 1 to 6 under conditions that permit amplification and detection of said target sequence, and
  - (b) detecting any amplified target sequence,wherein detection of an amplified target sequence indicates the presence of one or more *Salmonella* species in the sample.
- 12. The method according to claim 11, further comprising a step to enrich the microbial content of the test sample prior to step (a).
- 13. A kit for the detection of one or more *Salmonella* species in a sample, said kit comprising:
  - (a) a first polynucleotide primer comprising at least 7 nucleotides of the sequence as set forth in SEQ ID NO:1;
  - (b) a second polynucleotide primer comprising at least 7 nucleotides of a sequence complementary to SEQ ID NO:1; and
  - (c) a polynucleotide probe comprising at least 7 consecutive nucleotides of the sequence as set forth in SEQ ID NO:30, or the complement thereof.
- 14. The kit according to claim 13, wherein said first and second polynucleotide primers comprise at least 7 nucleotides of the sequence as set forth in any one of SEQ ID NOs:16 to 22.
- 15. The kit according to claim 13 or 14, wherein said polynucleotide probe comprises at least 7 nucleotides of the sequence as set forth in any one of SEQ ID NOs:35, 37, 39 or 41.
- 16. The kit according to any one of claims 13, 14 or 15, wherein said first polynucleotide primer comprises at least 7 nucleotides of the sequence as set forth in SEQ ID NO:32 and said second polynucleotide primer comprises at least 7 nucleotides of the sequence as set forth in SEQ ID NO:33.

17. The kit according to claim 13, wherein said first polynucleotide primer comprises the sequence as set forth in SEQ ID NO:32, said second polynucleotide primer comprises the sequence as set forth in SEQ ID NO:33 and said polynucleotide probe comprises the sequence as set forth in SEQ ID NO:34 or 36.
18. The kit according to claim 13, wherein said first polynucleotide primer comprises the sequence as set forth in SEQ ID NO:32, said second polynucleotide primer comprises the sequence as set forth in SEQ ID NO:33 and said polynucleotide probe comprises the sequence as set forth in SEQ ID NO:38 or 40.
19. An isolated *Salmonella* specific polynucleotide having the sequence as set forth in SEQ ID NO:30, or the complement thereof.
20. A polynucleotide primer of between 7 and 100 nucleotides in length for the amplification of a portion of a *Salmonella phoP* gene, said polynucleotide comprising at least 7 consecutive nucleotides of the sequence as set forth in SEQ ID NO:30, or the complement thereof.
21. The polynucleotide primer according to claim 20, wherein said polynucleotide comprises at least 7 consecutive nucleotides of the sequence as set forth in any one of SEQ ID NOs:32, 33, 35, 37, 39 or 41.
22. The polynucleotide primer according to claim 20 or 21, wherein said polynucleotide comprises the sequence as set forth in SEQ ID NO:32 or SEQ ID NO:33.
23. A polynucleotide probe of between 7 and 100 nucleotides in length for detection of *Salmonella*, said polynucleotide comprising at least 7 consecutive

nucleotides of the sequence as set forth in SEQ ID NO:30, or the complement thereof.

24. The polynucleotide probe according to claim 23, wherein said polynucleotide comprises at least 7 consecutive nucleotides of the sequence as set forth in any one of SEQ ID NOs:32, 33, 35, 37, 39 or 41.
25. The polynucleotide probe according to claim 23 or 24, wherein said polynucleotide comprises the sequence as set forth in any one of SEQ ID NOs:35, 37, 41 or 43.
26. The polynucleotide probe according to claim 23 or 24, wherein said polynucleotide comprises the sequence as set forth in any one of SEQ ID NOs:34, 36, 38 or 40.
27. The polynucleotide probe according to any one of claims 23 to 26, wherein said polynucleotide further comprises a fluorophore, a quencher, or a combination thereof.